Supplemental Specification
2005 Standard Specification Book

SECTION 02721

UNTREATED BASE COURSE (UTBC)

Delete Section 02721 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Production, construction, and compaction of UTBC used for pavements, shoulders, and incidental construction.

1.2 RELATED SECTIONS

A. Section 01572: Dust Control and Watering

1.3 REFERENCES

A. AASHTO T 11: Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing

B. AASHTO T 19: Bulk Density ("Unit Weight") and Voids in Aggregate

C. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

D. AASHTO T 89: Determining the Liquid Limit of Soils

E. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils

F. AASHTO T 96: Resistance to Degradation of Small-Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

G. AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54 kg (10 lb) Rammer and 457 mm (18 in) Drop

H. AASHTO T 193: The California Bearing Ratio

I. AASHTO T 255: Total Evaporable Moisture Content of Aggregate by Drying

J. AASHTO TP 61: Determining the Percent of Fracture in Coarse Aggregate

K. UDOT Minimum Sampling and Testing Requirements

1.4 SUBMITTALS

A. Submit a written report for approval for each aggregate class and source, a minimum of five working days prior to placement. Include the following:
   1. Aggregate suitability. Refer to this Section, Part 2, Products.
   2. Name of supplier and location of source.
   3. Maximum Dry Density and Optimum Moisture Content. Refer to AASHTO T 180, Method D.
   4. Job mix gradation including single values for each sieve size, No. 4 and finer, within the gradation limits of Table 2.

1.5 ACCEPTANCE

A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.

B. Type I Placement – Pavement Section (Includes placement for Curb or Curb and Gutter when in conjunction with placement for pavement section.)
   1. Use Class A aggregate, Table 1.
   2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations.
   3. Meet gradation limits and applicable tolerances of Table 2 for each gradation test. Each sublot will be evaluated separately and not averaged with other sublots.
   4. Meet minimum density test average of 97 percent of maximum laboratory density with no test less than 94 percent.

C. Type II Placement – Incidental (Includes placement for Curb, Curb & Gutter, Driveways, Pedestrian Access Ramps, Sidewalk, Waterways, Flatwork, and other items of work in the contract to which UTBC is included and not measured or paid for separately.)
   1. Use Class A or B aggregate, Table 1.
   2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations.
   3. Meet gradation limits and applicable tolerances of Table 2 for each gradation test. Each sublot will be evaluated separately and not averaged with other sublots.

4. Meet minimum density test average of 95 percent of maximum laboratory density with no test less than 92 percent.

D. Type III Placement – Shoulder
   1. Use Class A, B or C aggregate, Table 1.
   2. Adjust moisture content prior to compaction.

E. Material not meeting the gradation requirements may be allowed to remain in-place at the discretion of the Engineer, provided density requirements are met. However, additional lots may not be placed until the deficiencies are addressed and corrected.

F. When directed by the Engineer, correct material that does not meet the specified criteria by scarifying, placing additional material, re-mixing, reshaping and re-compacting. Rework unacceptable material at no additional cost to the Department.

G. Do not place additional material on any unaccepted layer.

H. When directed by the Engineer, remove products found defective after placement and replace with acceptable products at no additional cost to the Department

PART 2 PRODUCTS

2.1 AGGREGATES

A. Well-graded, clean, hard, tough, durable and sound mineral aggregates consisting of crushed stone, crushed gravel or crushed slag; free of organic matter and contamination from chemical or petroleum products; meeting the requirements of Table 1.

Table 1

Aggregate Properties				
	Aggregate Class			
	A	B	C	
Dry Rodded Unit Weight	Not less than 75 lb/ft^3			AASHTO T 19
Liquid Limit/ Plastic Index	Non-plastic		PI ≤ 6	AASHTO T 89 AASHTO 90
Aggregate Wear	Not to exceed 50 percent.			AASHTO T 96
Gradation	Table 2			AASHTO T 11 AASHTO T 27
CBR with a 10 lb surcharge measured at 0.20 inch penetration	70% Minimum		N/A	AASHTO T 193
Two Fractured Faces	50 % Min	N/A	N/A	AASHTO TP 61

B. Establish the job mix (target) gradation for the ¾ inch sieve and finer within the gradation limits. The Job Mix Gradation Tolerance is the allowable deviation from the job mix (target) gradation on the applicable sieves. All other percents passing will be within the gradation limits. Refer to AASHTO T 11 and AASHTO T 27.

Table 2

Gradation Limits		
Sieve Size	**Job Mix Gradation Target Band**	**Job Mix Gradation Tolerance**
1-1/2 inch	100	
1 inch	90 - 100	±9.0
3/4 inch	70 - 85	±9.0
1/2 inch	65 - 80	±9.0
3/8 inch	55 - 75	±9.0
No. 4	40 - 65	±7.0
No. 16	25 - 40	±5.0
No. 200	7 - 11	±3.0

Percent passing based on total aggregate (dry weight), and fine and coarse aggregate having approximately the same bulk specific gravities.

PART 3 EXECUTION

3.1 INSTALLATION

A. Mixing: Provide moisture content of ± 2 percent of optimum at the time of placement. Refer to AASHTO T 180, Method D and AASHTO T 255.

B. Procedures for changing the Job-Mix Gradation
   1. Submit changes in writing 24 hours prior to placement for approval by the Engineer.

C. Placing: Place in layers of uniform thickness and compact each layer to a thickness not to exceed a 6 inch depth. Do not place on any frozen surface. Refer to Section 01572.

D. Finishing: Uniform line and grade with surface deviations no more than $^{3}/_{8}$ inch in 10 ft in any direction.
   1. Profile Tolerance — Correct any profile deviations greater than $^{3}/_{8}$ inch.
      a. Rework minimum of 4-inch lift to achieve homogeneous density.
      b. Determine limits of correction based on extent of deviation.
      c. Continue finishing until existing deviation is less than $^{3}/_{8}$ inch.

E. Compaction: Maintain optimum moisture content ± 2 percent.
   1. Use appropriate compaction equipment adjacent to abutments, backwalls, approach slabs, wing walls, retaining walls, and other structures.
   2. Use a minimum of 2 passes with a roller for Type III placement or as directed by the Engineer.

END OF SECTION